DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 5, 2011 has been entered.

Claims 47 and 49-50 are cancelled, and claims 28-29, 31-39, 41-46 and 48 are pending.

Claim Objections

Claims 28-29, 31-39, 41-46 and 48 are objected to because of the following informalities: the claims recite a "checkerboard configuration," yet the specification explicitly refers to a "chessboard configuration." Appropriate correction is required. Although a checkerboard and chessboard configuration are synonymous, the Examiner believes the claims should recite terminology consistent with the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 28-29, 33-38 and 41-44 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: a hole plate between the manifold head and monolithic structure. As disclosed (page 21, bottom paragraph, in part below), a hole

plate transforms the linear flow from the manifold head into a chessboard pattern in the monolith structure.

> Figure 2 displays an assembly of a monolith with hole plates and manifold head. A typical monolith stack or monolith unit will have two such manifold heads at the two monolith faces where the inlet and outlet openings of the channels are located. By means of the hole plates fluid flow system is transformed from linear arrangement in manifold head to chessboard pattern arrangement in monolith or vice versa. The manifold head is built up by a set of dividing plates

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 28, 31-35, 38, 43-44 and 48 as best understood are rejected under 35 U.S.C. 103(a) as being unpatentable over Morse in view of Veltkamp.

Morse (Figure 1 marked up, next page) discloses a manifold system comprising:

a multi-channel monolithic structure including outer structure walls 18, 42 (Figure 8) and inner structure walls 12 defining a plurality of channels with fins 14, 16 spread over an entire cross-sectional area;

a manifold head including a first tunnel 22a and a second entry/exit point (Gas Out arrows) distributing two fluids separately into and out of the channels,

wherein the first tunnel 22a includes a wall 50 having through slots (at transition 63 in Figure 6) communicating with first gaps in the manifold head,

wherein the second entry/exit point includes a second wall along angled planes (Figures 1-2 and 4) having through slots communicating with second gaps in the manifold head, and

wherein at least one of the inner channel walls 12 is common between the first and second fluids (Figure 8),

but does not disclose the manifold head distributing fluid in a checkerboard configuration into the monolithic structure.

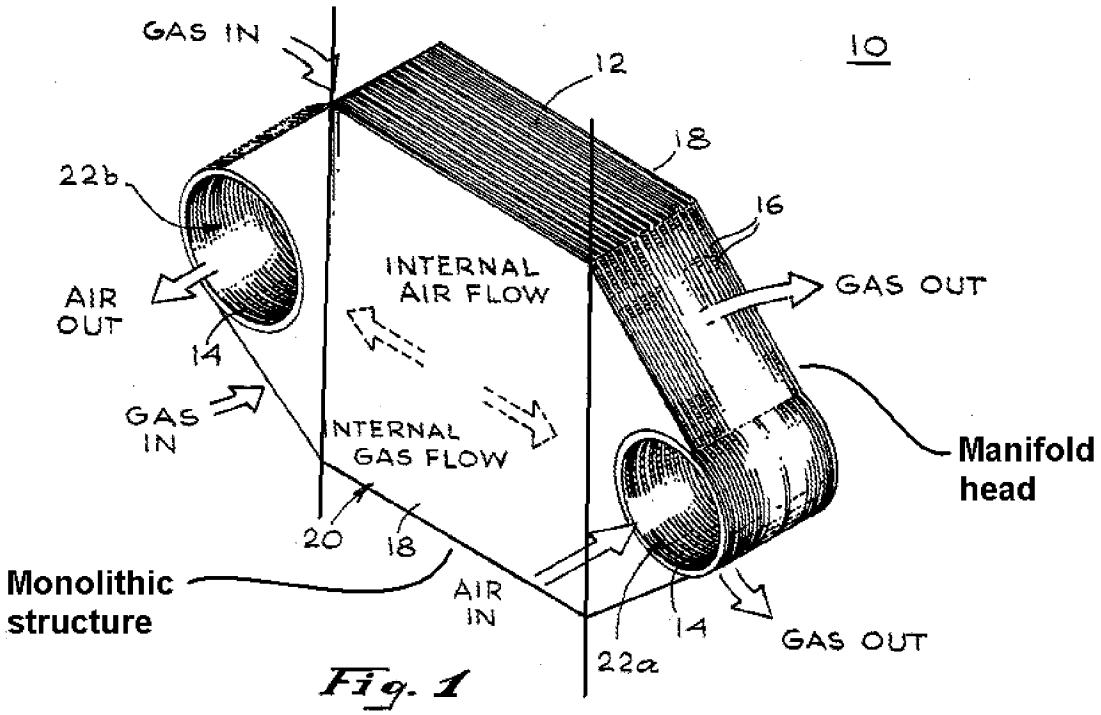

Fig. 1

Veltkamp (Figures 4-5) discloses a manifold system comprising a manifold head 9, monolithic structure 1 and a hole plate 7 there between for the purpose of providing a chessboard flow pattern to improve heat transfer (column 1, lines 49-55).

Since Morse and Veltkamp are both from the same field of endeavor and/or analogous art, the purpose disclosed by Veltkamp would have been recognized in the pertinent art of Morse.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Morse a hole plate between the manifold head and monolithic structure for the purpose of providing a chessboard flow pattern to improve heat transfer as recognized by Veltkamp.

Regarding claims 31-32, 34 and 48, as noted above, Figure 5 of Veltkamp discloses a hole plate 7 between the manifold head 9 and monolithic structure 1, wherein the hole plate 7 has a chessboard pattern corresponding to the monolithic structure 1.

Regarding claim 33, the Examiner takes Official Notice of a catalytic coating for their use in the reactor art and would be within the level of ordinary skill in the art.

Regarding claim 35, Figure 2 of Veltkamp discloses obliquely oriented channel walls. The specific angle is considered to be an obvious design choice, producing no new and/or unexpected results. One of ordinary skill in the art would employ oriented channel walls with any desired angle to accommodate transitioning between the manifold head and monolith structure.

Regarding claim 38, Figure 1 (marked up, previous page) of Morse discloses the manifold head is fluidly "sealed" to at least one face of the monolithic structure where the channel openings are located.

Regarding claim 43, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). The recitation of a "reactor" does not set forth any structural limitation, rather an intended use or working environment to which a device is to be employed. The structure of the device of the combination of Morse and Veltkamp meets the claim.

Regarding claim 44, the device of the combination of Morse and Veltkamp having similar structure operates in a manner similar to the method claim.

Claims 29, 36-37, 39, 41 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morse in view of Veltkamp as applied to claims 28, 31-35, 38, 43-44 and 48 above, and further in view of Dahlgren.

The combined teachings of Morse and Veltkamp lacks an inner opening in the end cover plates.

Dahlgren discloses a heat exchanger comprising two manifold systems, one of which comprises a least three dividing plates 6 and end cover plates 6 (i.e. outermost plates), each including an inner opening 7 for the purpose of facilitating fluid coupling and plumbing with another unit.

Since Morse and Dahlgren are both from the same field of endeavor and/or analogous art, the purpose disclosed by Dahlgren would have been recognized in the pertinent art of Morse.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Morse an inner opening in each end cover plate for the purpose of facilitating fluid coupling and plumbing with another unit as recognized by Dahlgren.

Regarding claim 36, Figures 1, 3 and 5 of Dahlgren discloses a seal plate 10 having a plurality of holes 15 that are fluidly "sealed" with three parallel dividing plates 6.

Regarding claim 37, Figure 1 of Morse discloses the manifold head, which is formed by at least three parallel dividing plates 12 (Figure 5) is fluidly "sealed" to at least one face of the monolithic structure where the channel openings are located.

Regarding claim 39, as applied to claims 31-32, 34 and 48 above, Figure 5 of Veltkamp discloses a hole plate 7 between the manifold head 9 and monolithic structure 1.

Regarding claim 41, Figures 1 and 5 of Dahlgren discloses a sealing ring 11 and two different types (i.e. different opening sizes) of end cover plates (i.e. outermost plates 6, 8).

Regarding claim 46, Dalhgren (column 2, lines 58-62) a plurality of manifold systems may be employed, wherein a plurality of four would read on a "row of stacks."

Claims 42 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morse in view of Veltkamp and Dahlgren as applied to claims 29, 36-37, 39, 41 and 46 above, and further in view of Albertsen.

The combined teachings of Morse, Veltkamp and Dahlgren lacks a plurality of rows of manifold systems.

Albertsen (Figure 8) discloses a block comprising a plurality of manifold systems U, V, W arranged in a plurality of rows for the purpose of increasing the heat exchange capacity.

Since Morse and Albertsen are both from the same field of endeavor and/or analogous art, the purpose disclosed by Albertsen would have been recognized in the pertinent art of Morse.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ the device of Morse with a plurality of manifold systems arranged in a plurality of rows for the purpose of increasing the heat exchange capacity as recognized by Albertsen.

Response to Arguments

The rejections under 35 U.S.C. 112, second paragraph, are withdrawn in light of the claim amendments.

The rejections in view of Holm are withdrawn light of the claim amendments.

Applicants' arguments filed have been fully considered but they are not persuasive.

As noted in the previous Office action, the secondary reference of Veltkamp teaches one of ordinary skill in the art to employ a hole plate 7 between a manifold head and monolithic structure for the purpose of providing a chessboard flow pattern to improve heat transfer (column 1, lines 49-55). Applicants do not traverse this fact.

No further comments are deemed necessary at this time.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard R. Leo whose telephone number is (571) 272-4916. The examiner can normally be reached on Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Swann can be reached on (571) 272-7075. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/ Leonard R. Leo /
PRIMARY EXAMINER
ART UNIT 3785

October 20, 2011